Section I: Part E
Wind/Boat Relationships - Concepts

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Lesson Outline

- Lesson objectives
- Introduction
- Points of sail
- Summary
- Quiz

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Lesson Objectives

- In this lesson you will learn about the sailing circle and points of sail
- You will develop the language used to describe the various points of sail
- You will learn where and how you can sail in relation to the wind

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Introduction

- The previous lesson introduced terminology regarding wind direction and boat position in relation to the wind, shore or other objects.

- We are now going to learn the different positions we can move the boat to, in relation to the wind and how these positions are described.

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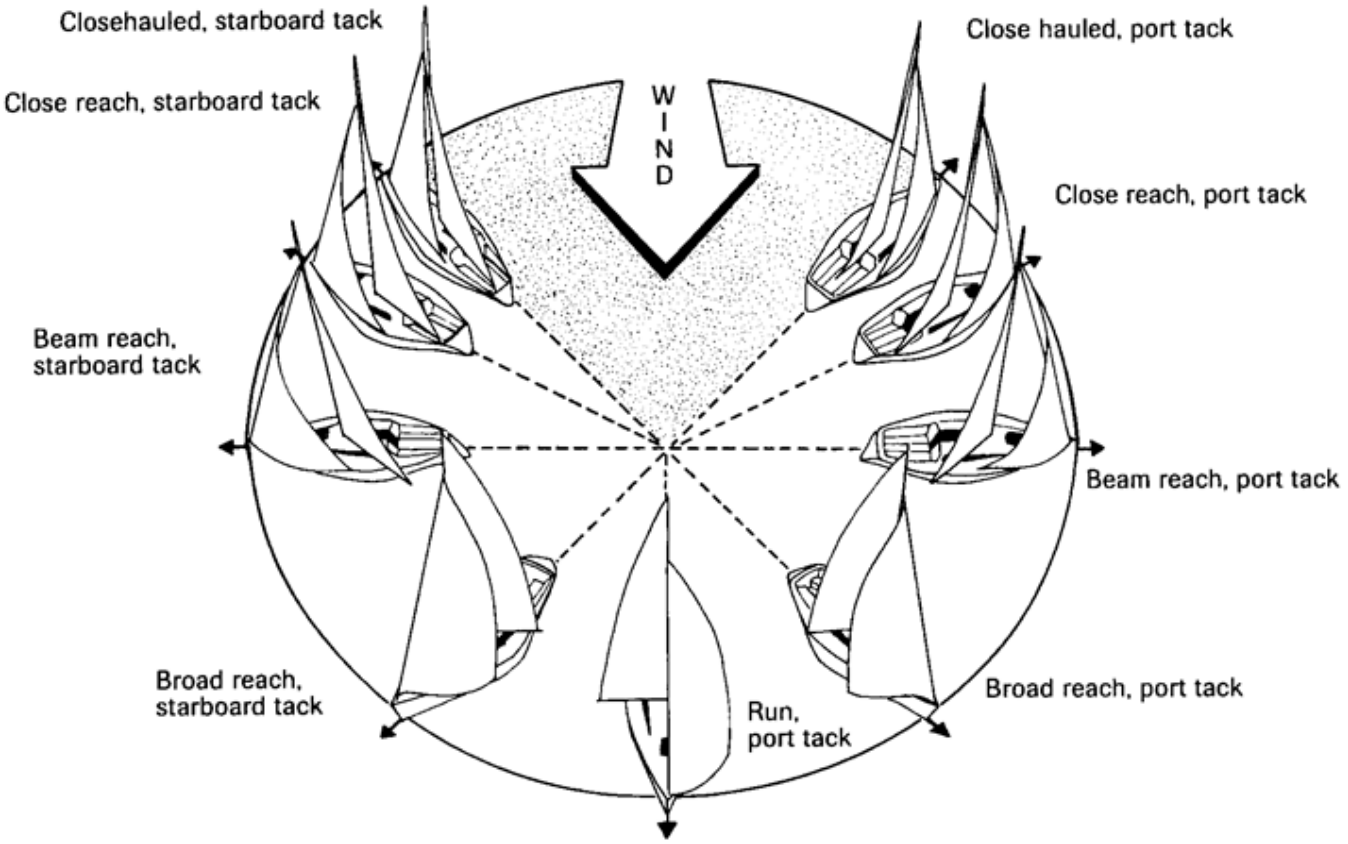
Points of sail



The Sailing Circle – Points of Sail and Port and Starboard Tack

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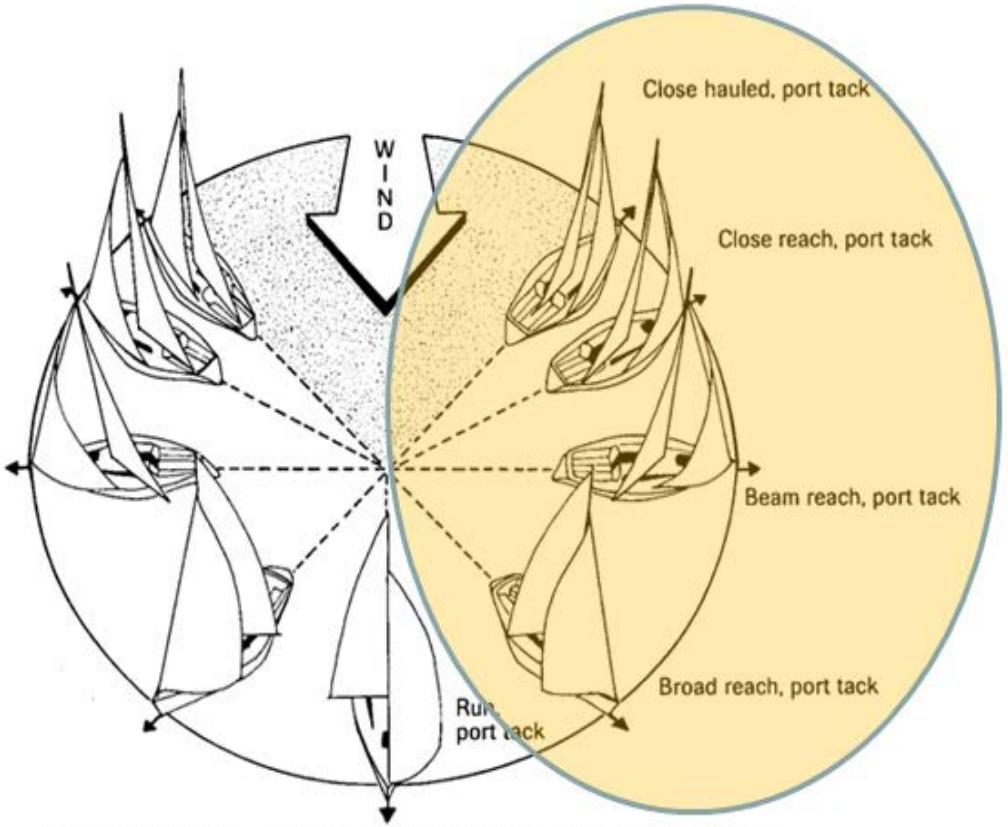
Points of sail – port tack

- When the wind comes over the left side (port side) of the boat then the vessel is on a port tack.
- The four boats on the right of the sailing circle are on a port tack.



The Sailing Circle – Points of Sail and Port and Starboard Tack

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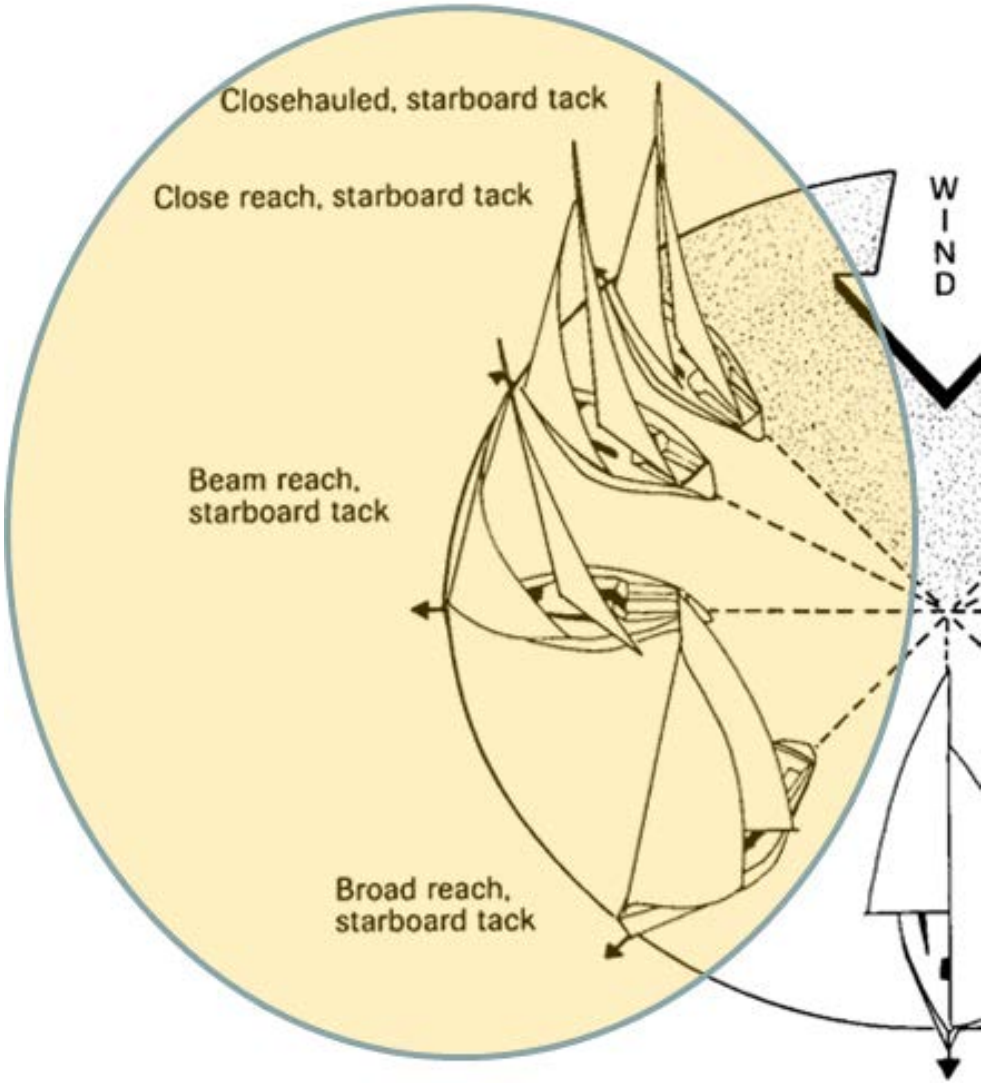
Points of sail – starboard tack

- The four boats on the left of the sailing circle have the wind coming over the right or starboard side. These boats are on a starboard tack.



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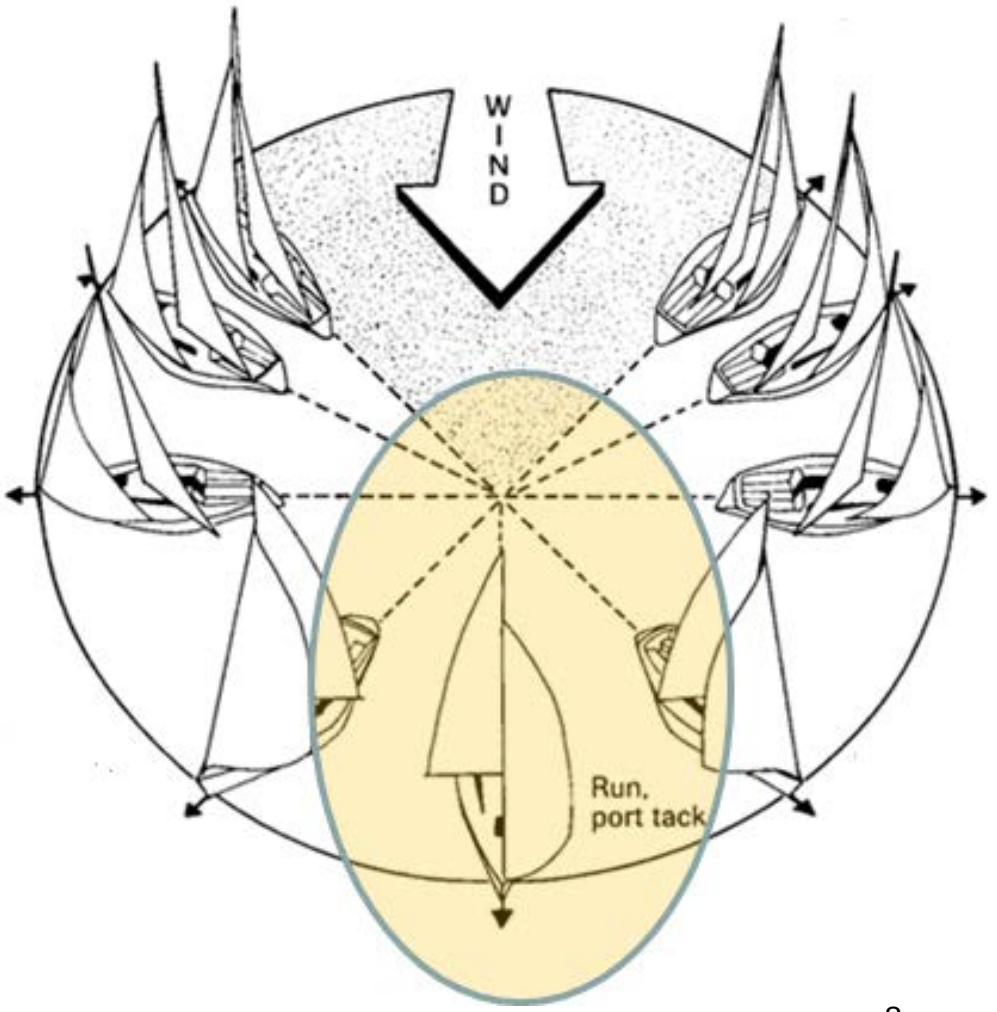
Points of sail – on a run

- This boat (bottom boat) is on a run.
- This means the wind is coming over the stern.
- In this case, you define the tack (port or starboard) as opposite to the side the boom/mainsail is on. So when the boom is on the starboard side you are on a port tack.



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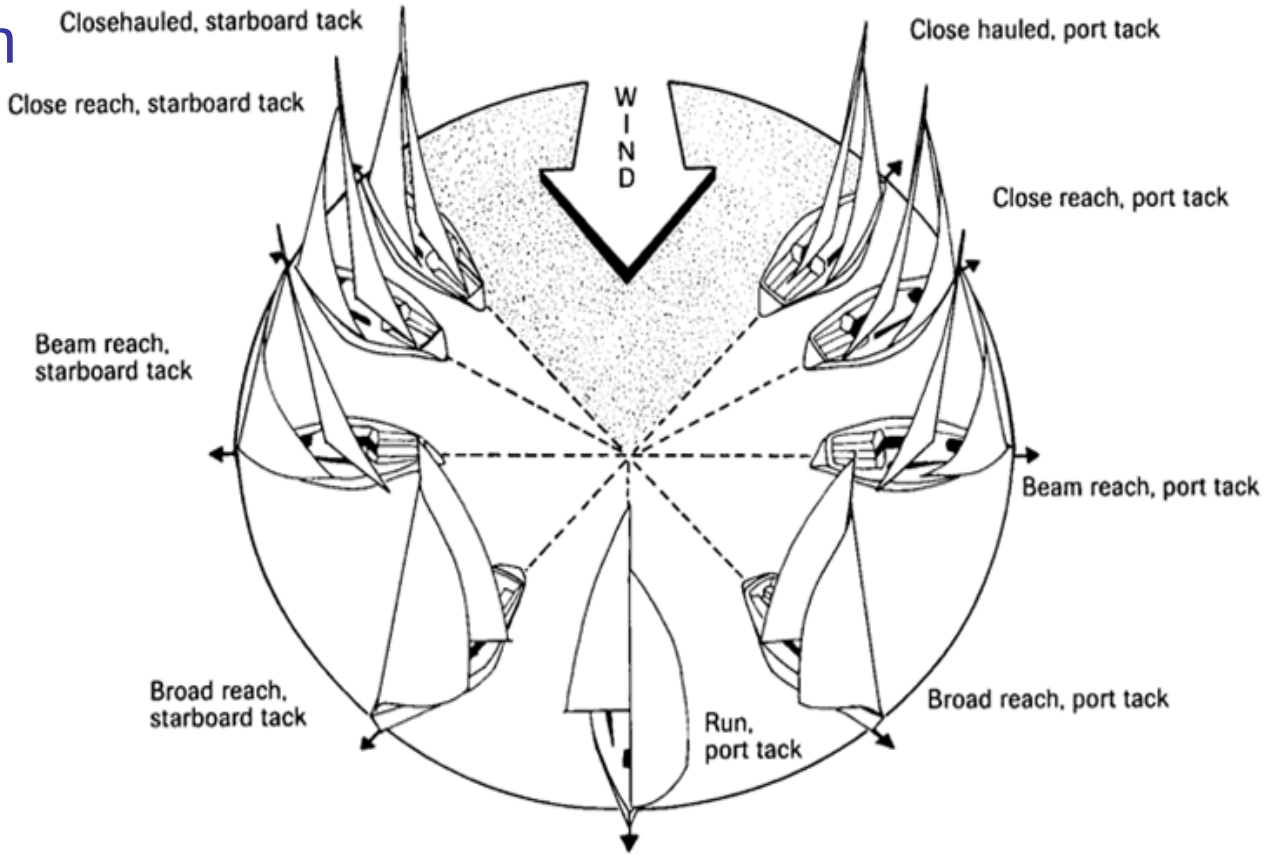
Points of sail

- There are 5 points of sail on each tack.
- Notice the angle that the sails are set in relationship to the centerline of the vessel.



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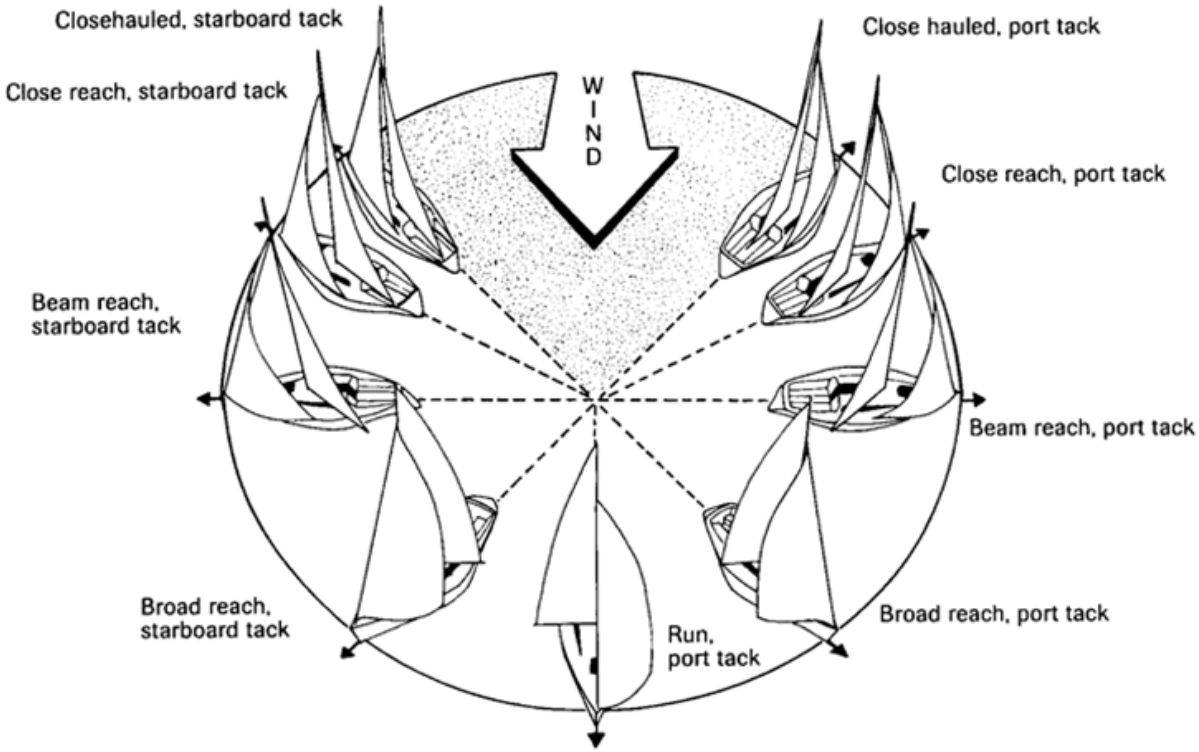
Five points of sail

- As you bear off in a clockwise direction note that the sails are let out on the port tack until the boat goes past the run (gybe) to a starboard tack.



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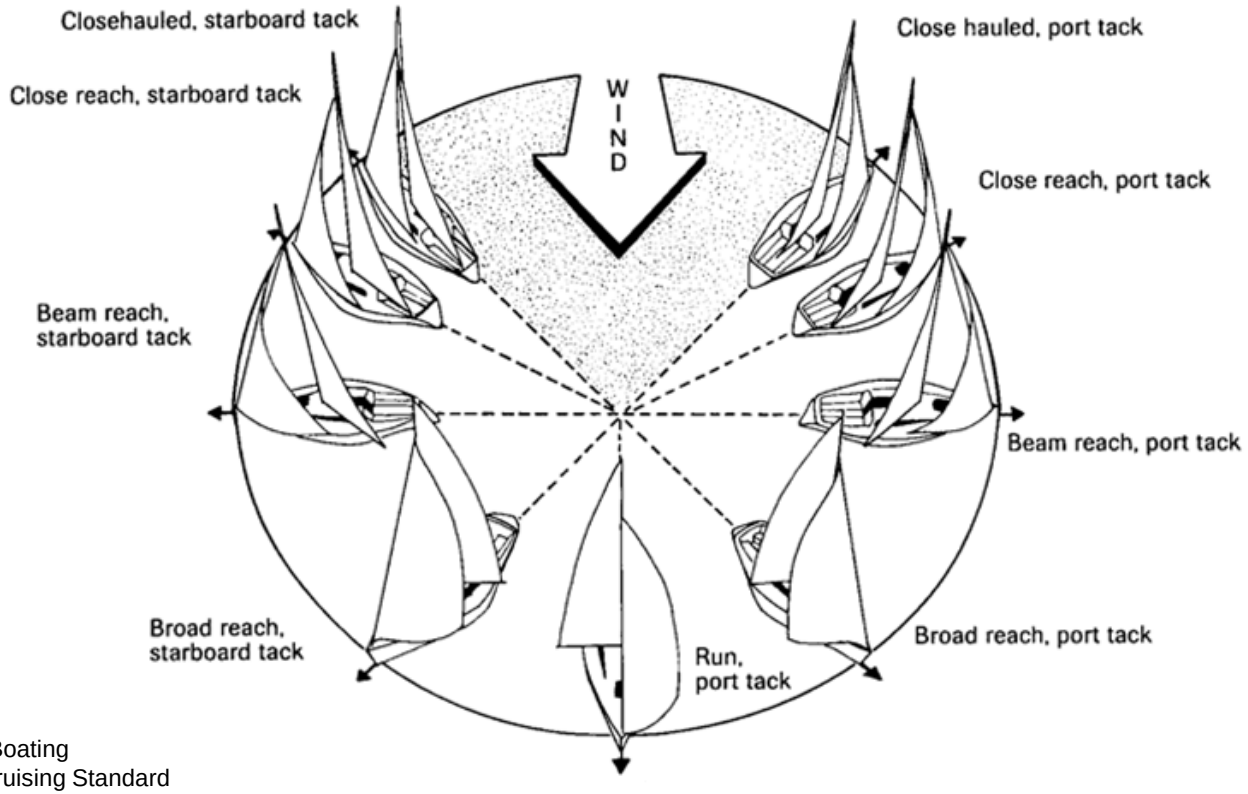
Five points of sail

- As you begin heading up, the sails get trimmed in closer for each point of sail until they are very close to the centerline and therefore close-hauled.



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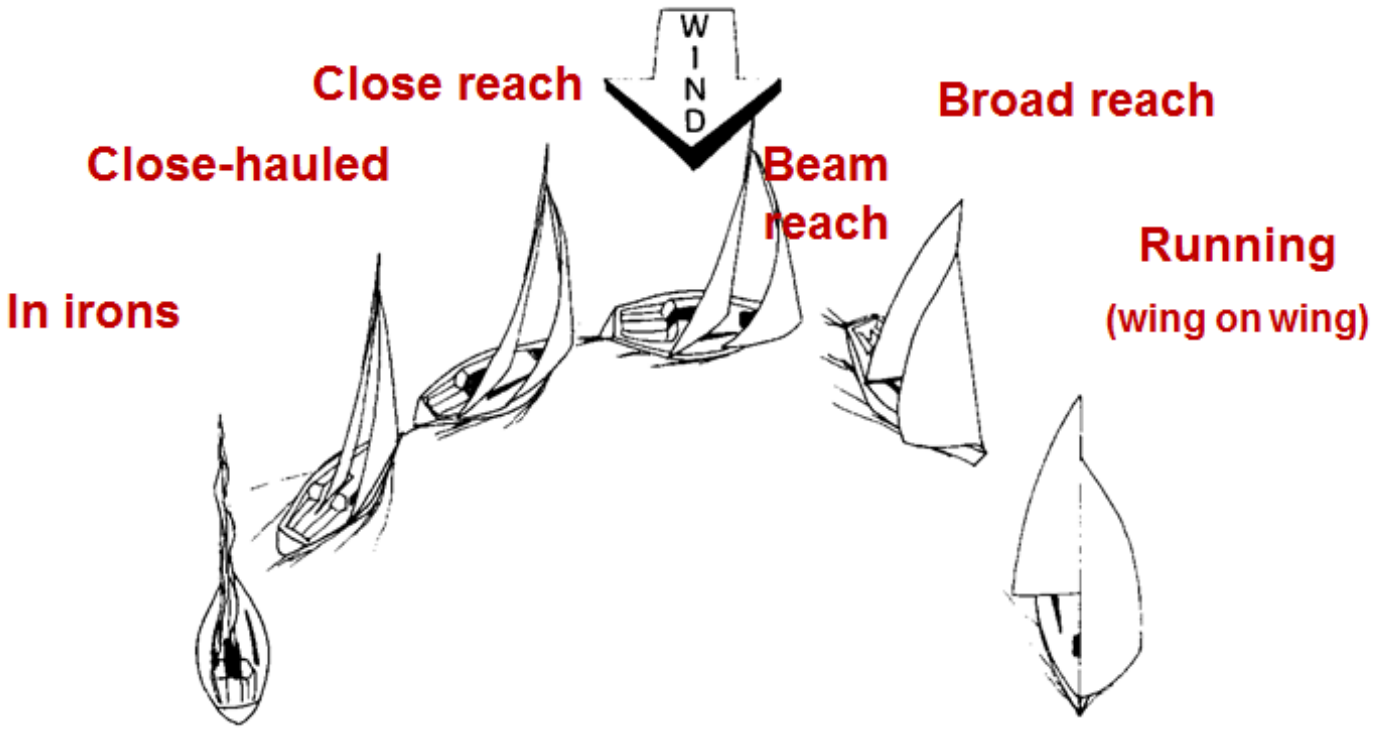
Points of sail – a different view

Sailing as close to the wind as possible, without the sails luffing, at an angle of about 45° to the wind direction, is ***closehauled.***



Another view. From left to right: head to wind, closehauled, close reach, beam reach, broad reach, run.

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In Irons

- If you keep “**heading up**” further into the wind, the sails can’t propel the boat anymore.
- When you are in this situation you are in a “no sailing zone” called being “**in irons**”

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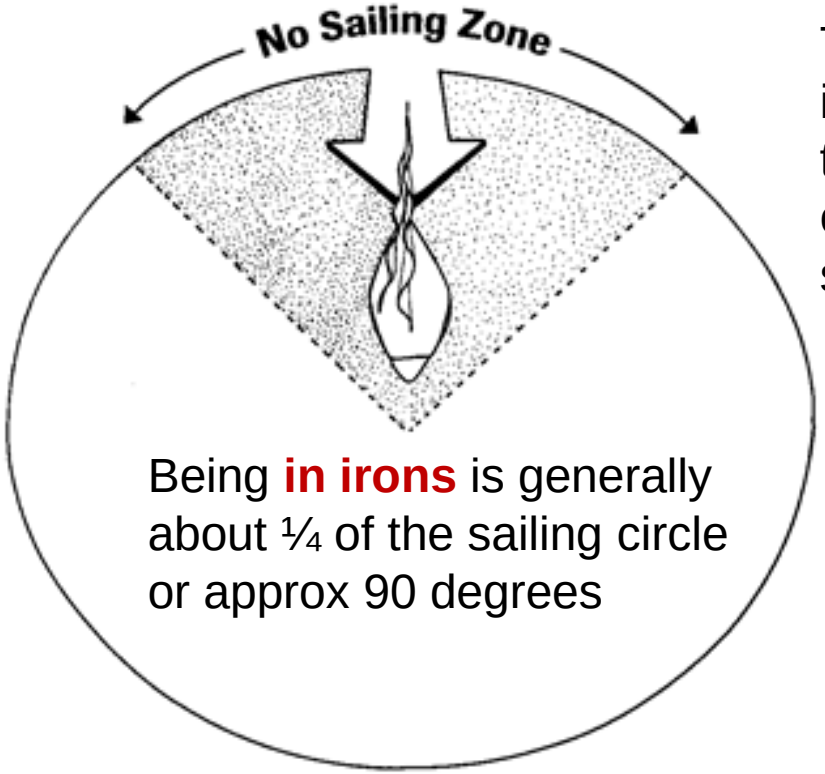
The no sailing zone (in irons) in the sailing circle

Wind direction



The **sailing circle** (an imaginary circle around the boat) is used to help explain the theory of sailing.

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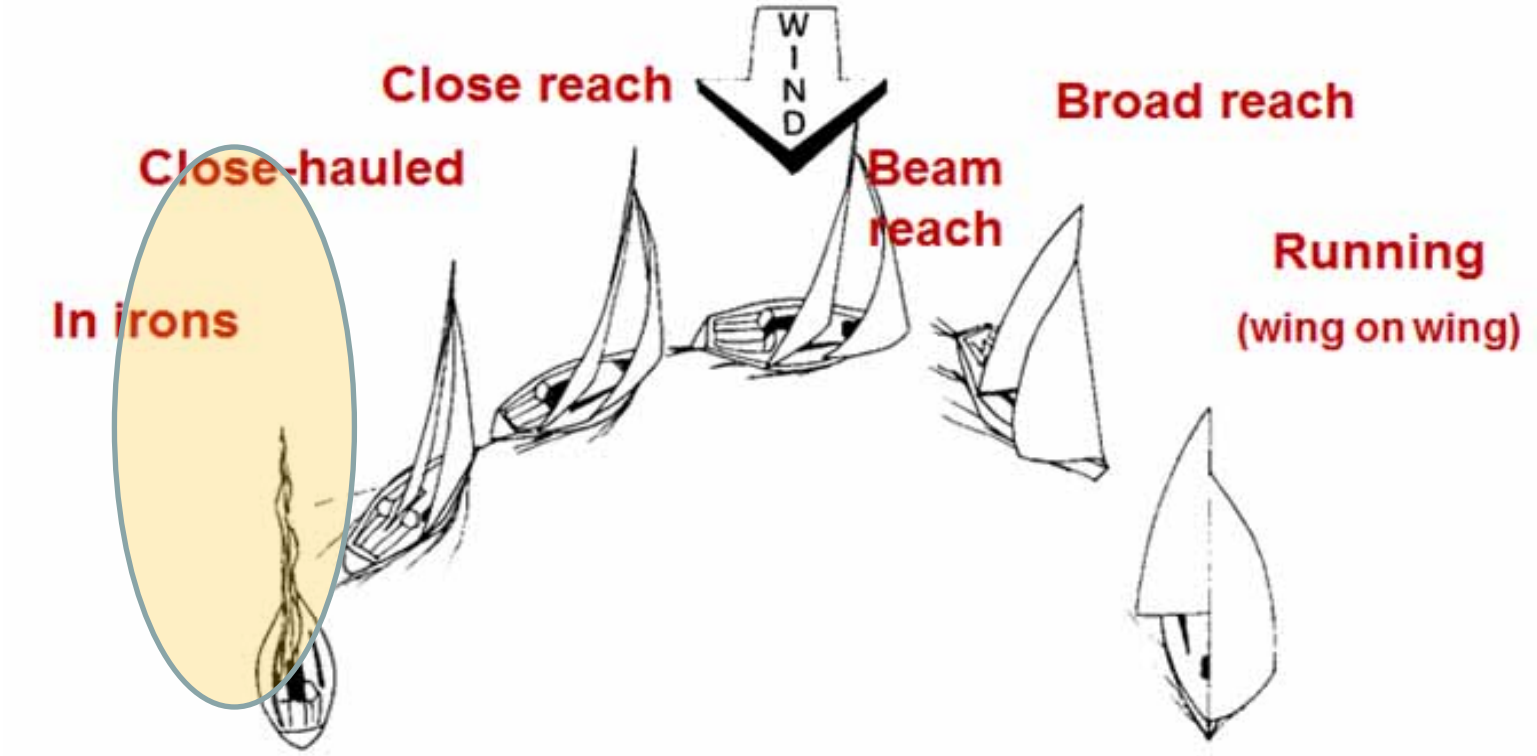
In irons (head to wind)

- See bottom left: The vessel is close to the direction of the wind and is in the no sailing zone which is referred to as "**in irons**"



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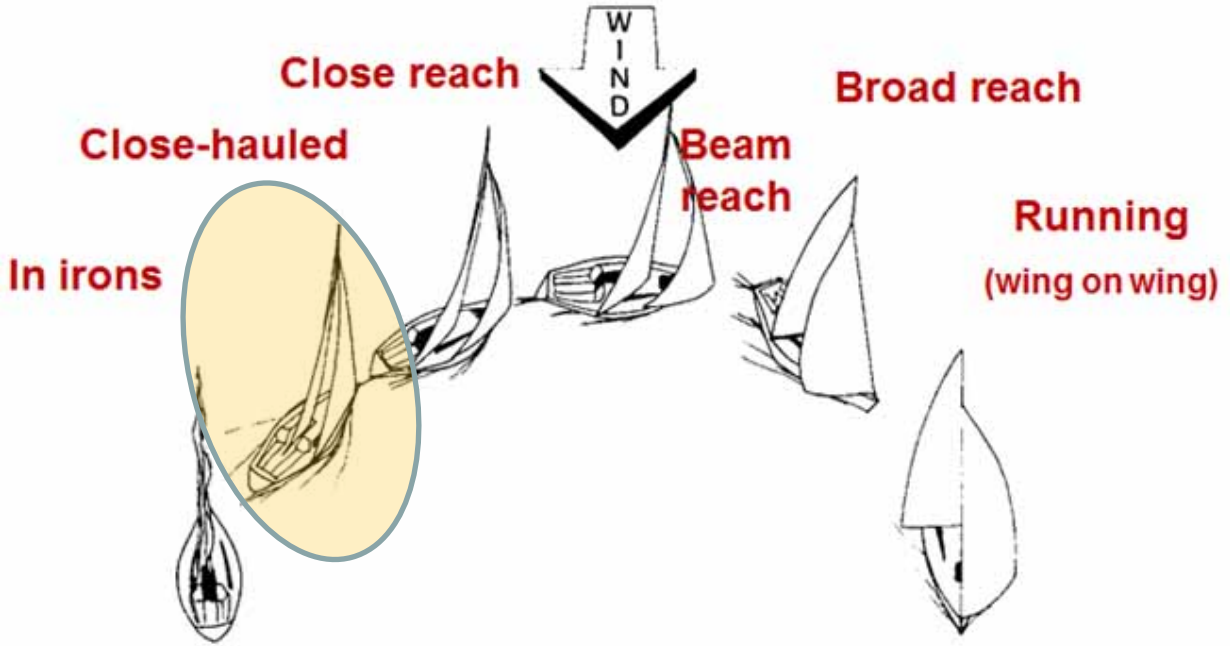
Close-hauled

- **Close-hauled** is the point of the sail in which the sails are sheeted in close to the centerline so that it can sail as close to the wind as possible about 40 to 45 degrees on a typical cruising boat.

Sailing as close to the wind as possible, without the sails luffing, at an angle of about 45° to the wind direction, is ***closehauled***.



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Close-hauled

Close-hauled: Boat sailing as close to the wind as possible

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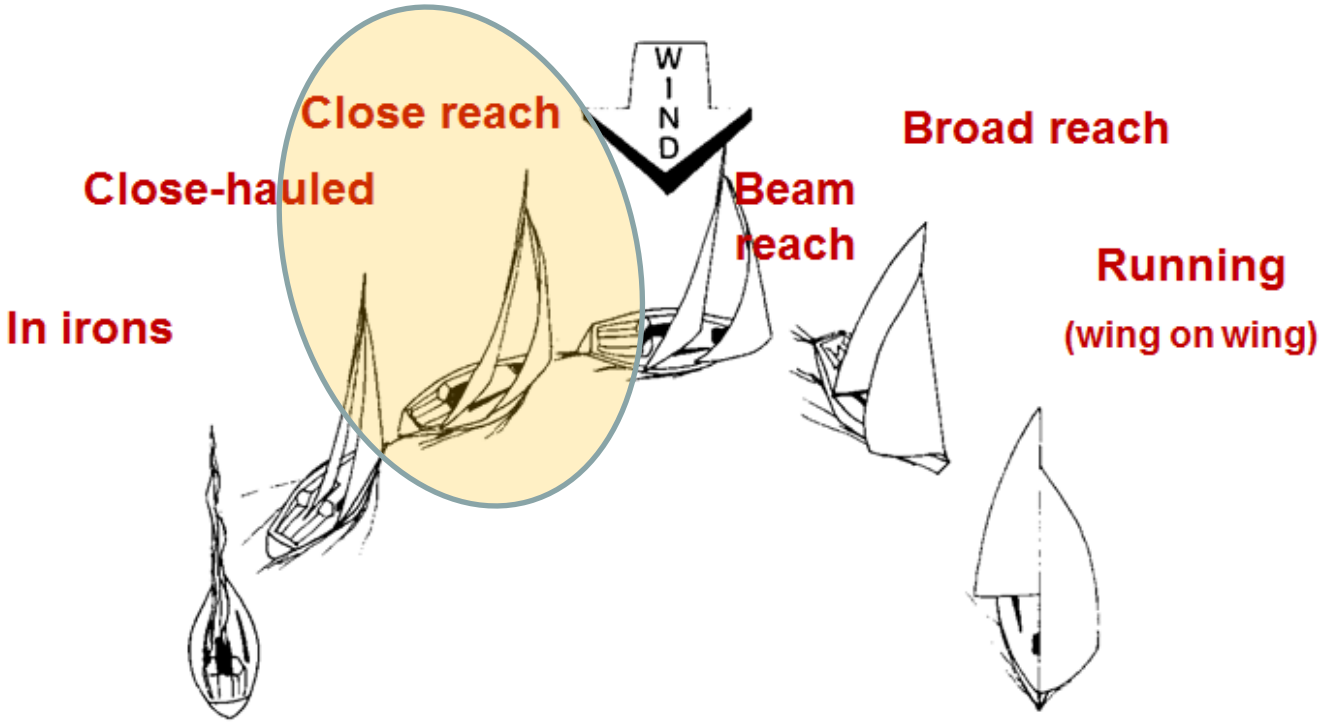
Close Reach

- **Close Reach** is when the vessel bears away a few degrees but the wind is still ahead of the beam of the boat. Approximately 50 – 80º off the wind.



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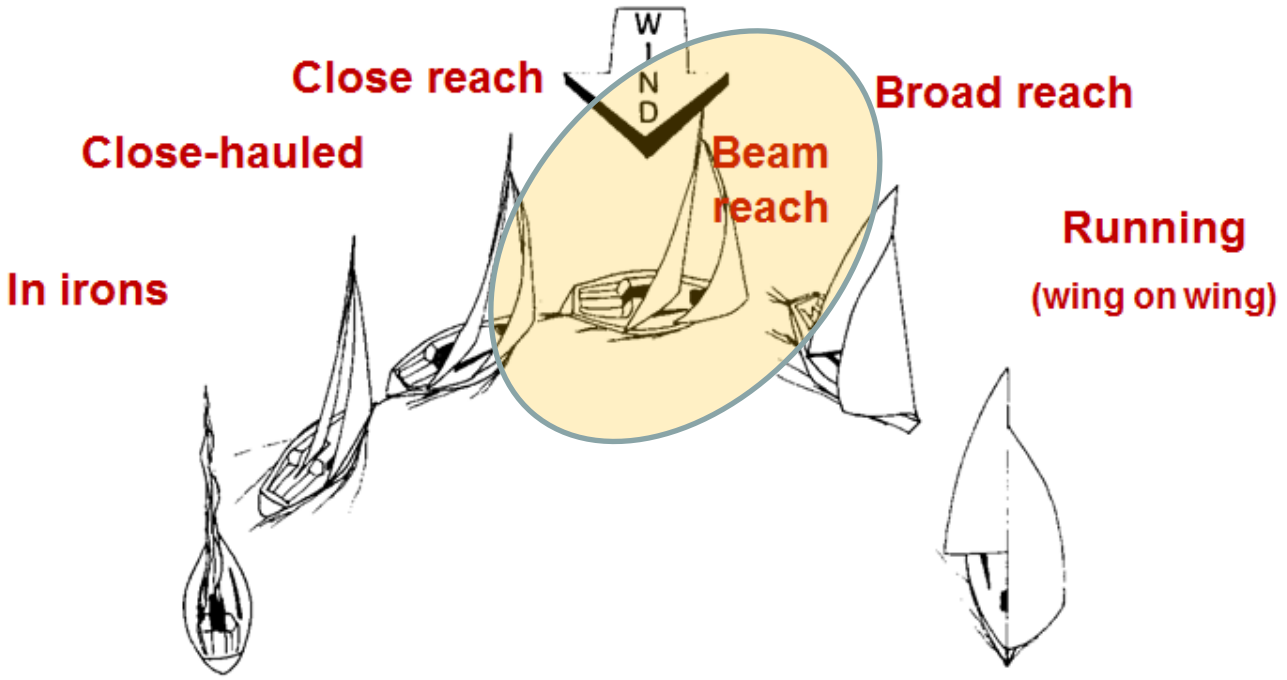
Beam Reach

- **Beam Reach** is when the wind is about 80 – 100º to the boat or on the beam of the boat



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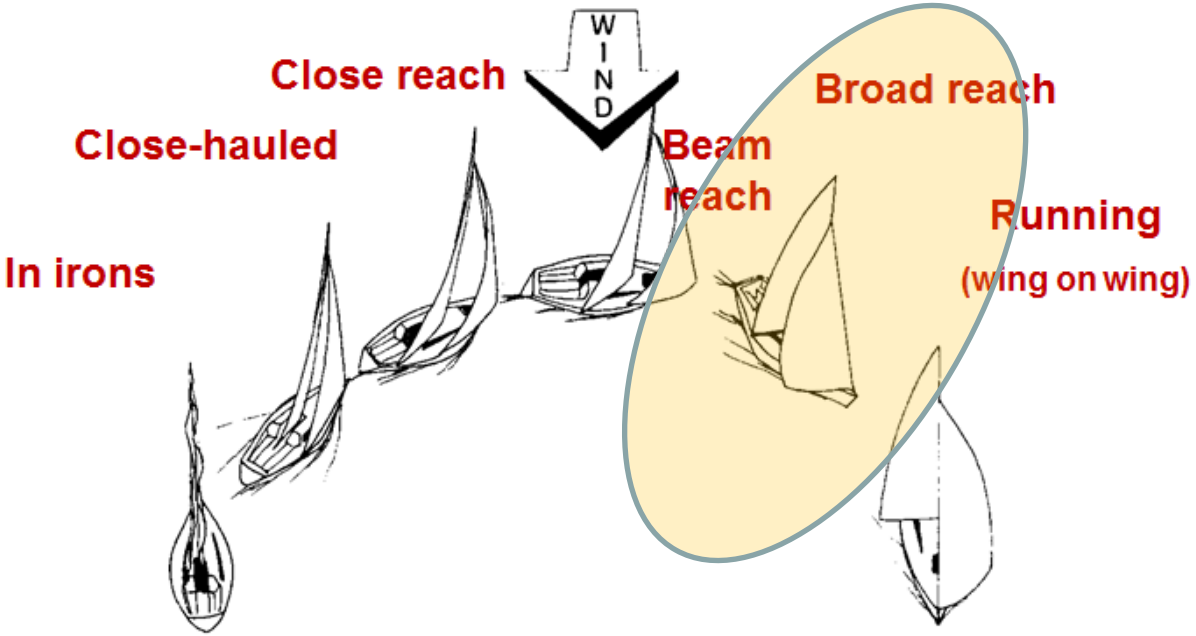
Broad Reach

- **Broad Reach** is when the wind is now further aft than the beam or between 100 - 160º from the bow. On this point of sail, the boat is now sailing downwind.



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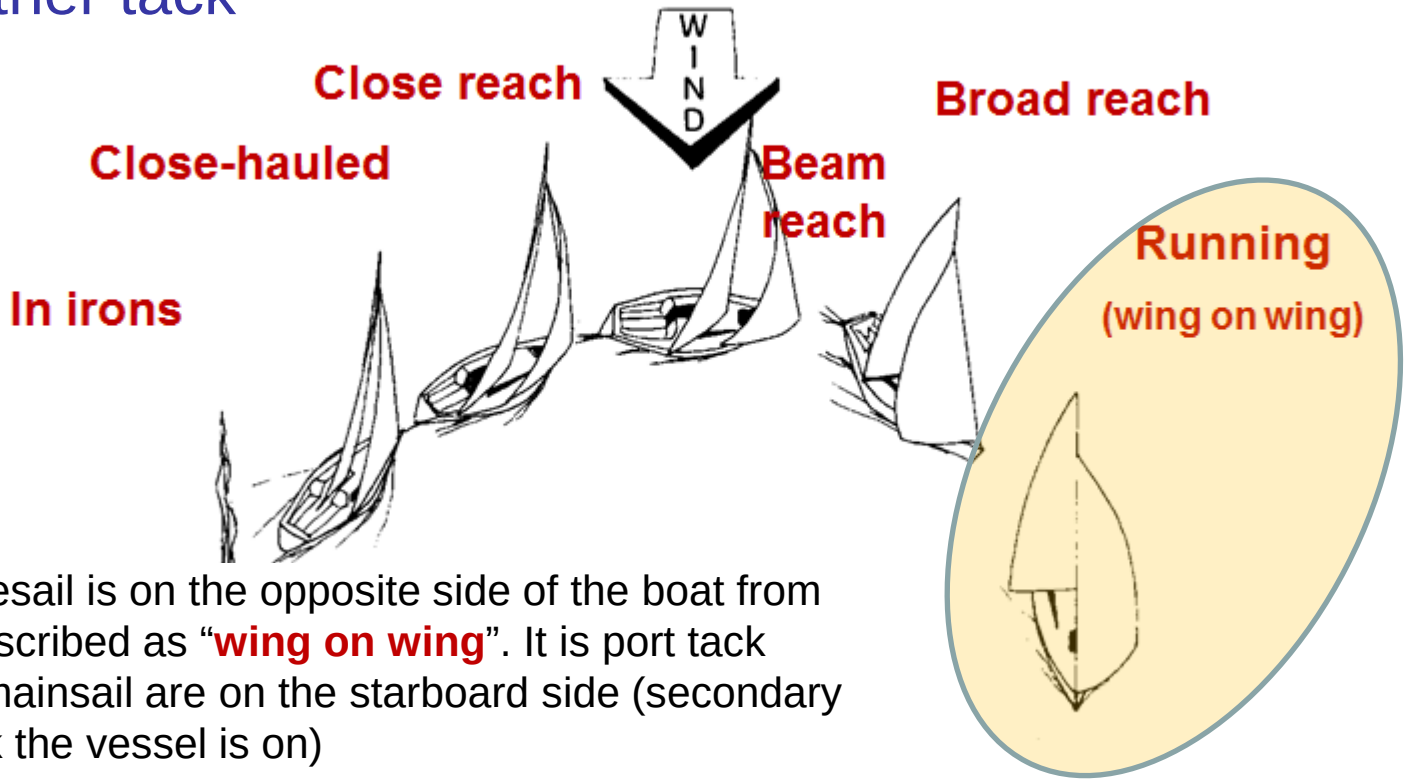
Run

- **Run (running)** is when the wind is coming directly over the stern of the vessel. Approximately between 160 and 180º on either tack



In this diagram the foresail is on the opposite side of the boat from the mainsail so it is described as "**wing on wing**". It is port tack because the boom & mainsail are on the starboard side (secondary definition of which tack the vessel is on)

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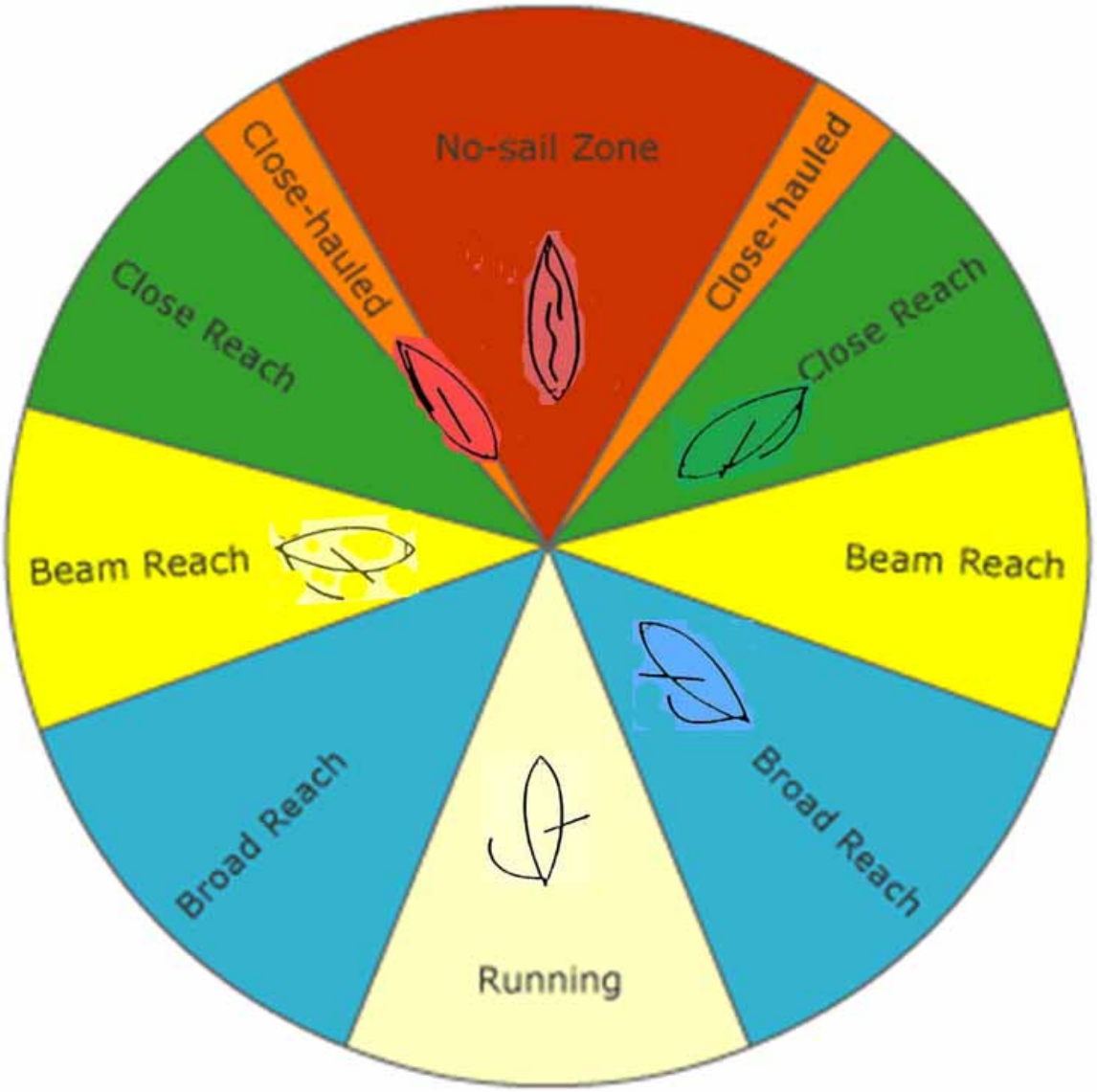
Points of sail – ranges

Note the position of the sails relative to the center of the boat on each point of sail



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Lesson Summary

- In this lesson you learned the various points of sail.
- You understand the difference between a port and starboard tack.
- You know where you can sail in relation to the wind direction.
- You learned the language to describe your point of sail and your tack. Communicating this information to your crew is important, so they can trim the sails to assist you in moving your vessel efficiently through the water.

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Let’s practice!

- Complete the following quiz to test your knowledge.

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Quiz

- Describe the position of the boat relative to the wind when the boat is considered to be “close-hauled.”
- Describe the position of the boat relative to the wind when the boat is consider to be “in irons.”
- Name the five points of sail.

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